PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Gregory A. Steinlage, et al.

Serial No.: 10/604,498 Group Art Unit: 2882

Filed: July 25, 2003 Examiner: Artman, Thomas R.

Title: NON-RUSTING AND NON-PARTICULATING IMAGING X-RAY TUBE ROTOR ASSEMBLY

Atty. Docket No.: 15-XT-6176 (GEMS-A 0130 PA)

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APPEAL BRIEF

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Alexandria, VA 22313-1450

Dear Sir:

The following Appeal Brief is submitted pursuant to the Notice of Appeal filed January 9, 2006, in the above-identified application.

I. Real Party in Interest

The real party in interest in this matter is GE Medical Systems Global Technology Company, LLC in Waukesha, Wisconsin (hereinafter "GE"), which is the assignee of the present invention and application.

II. Related Appeals and Interferences

There are no other known appeals or interferences, which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. Status of the Claims

Claims 1-16, 18-20, and 22-26 of the present application are currently pending. Claims 17 and 21 have been canceled. Claims 10, 13, and 20 are allowed. Claims 1-9, 11-12, 14-16, 18-19, and 22-26 stand under final rejection, from which this appeal is taken. A copy of the claims on appeal is attached as an Appendix.

IV. Status of Amendments

Claims 1, 16, 18, and 22 were amended in response to the Non-Final Office Action of May 5, 2005. In the August 3rd Response and in the Response of December 16, 2005, remarks were provided for the allowance of all currently pending claims. Amendments to claims 11, 25, and 26 were filed in the December 16th Response, but were not entered. No other amendments were filed subsequent to the May 5th Response. The Applicants have stated that the amendments filed on December 16, 2005 do not raise new issues that would require further consideration and/or search. This is due to the inclusion of limitations implicitly recited in claims 11, 25, and 26 or explicitly recited previously in claim 22. For example, claims 11 and 26 were amended to include the limitations of oxidizing via an induced oxidation process or greening effect. A similar limitation was previously recited in claim 22 and was provided in the Response of August 3, 2005. Claim 22 recites that the oxidation of an exterior surface of the sleeve is induced, which has not been amended since the August 3rd Response. Thus, the stated limitations have already been searched and considered by the Examiner.

Also, claim 25, in the December 16th Response, was amended to include the limitation of systematically and actively oxidizing. Applicants submit that the previously recited limitation of claim 22 of inducing oxidation of an exterior surface of a sleeve infers such a limitation. The term "induced" denotes that the oxidation process is brought about

by some actively provided means and that the oxidation process is not brought about by some natural means. The term "induced" means to bring about by influence. See *Merriam-Webster's Third New International Dictionary*. Besides the claims and thus the claim terms ought to be construed in view of and in a consistent manner with the specification. Applicants understand that limitations ought not to be read into the claims from the specification. However, in review of the application and definitions of the term "induced" one skilled in the art would clearly understand that the claimed limitation of inducing the oxidation process means to influence oxidation or to actively oxidize by some non-natural process, such as that disclosed in the present application. Thus, to claim that the oxidation is brought about by a systematic and active process is not to claim a new limitation, but is rather to explicitly recite that which was already inferred and examined. Thus, Applicants believe that the December 16th amendments ought to be entered. Regardless of whether the limitations are entered, the Applicants believe that the claims as provided in the May 5th Response are independently patentable and allowable for reasons provided below.

V. Summary of Claimed Subject Matter

By way of summary, the present invention is directed to imaging X-ray tube rotor assemblies and to methods of producing the same. Independent claims 1, 16, 18, and 22, encompass several points of novelty, and since claims 2-9, 11-12, 14-15, 19, and 23-26 depend from claims 1 and 18, respectively, they also contain at least the same points of novelty.

The imaging X-ray tube rotor assembly 30 of claim 1 includes a shaft 48, an x-ray tube rotor core 52, and a non-sprayed-on non-corrosive sleeve 66. The x-ray tube rotor core 52 is produced at least partially of a non-corrosive material and is integrally formed as a single component with the shaft 48. The x-ray tube rotor core 52 includes one or more slots 54 and one or more bars 56. The sleeve 66 is directly coupled to, at least partially covers, and is rotational with the rotor core 52. See paragraphs [0027]-[0031], [0035]-[0036], [0039]-[0041], [0045]-[0047], and Figures 2-4 of the present application.

The imaging X-ray tube rotor assembly 30 of claim 16 includes an x-ray tube rotor core 52 and a non-sprayed-on sleeve 66. The x-ray tube rotor core 52 is produced at least partially from stainless steel and includes slots 54 integrally formed with the rotor core 52. The x-ray tube rotor core 52 also includes bars 56 that are produced at least partially from a non-magnetic highly conductive material and are coupled to the slots 54. A non-sprayed-on sleeve 66 is in contact with, is coupled over, and is rotational with the rotor core 52. . See paragraphs [0027]-[0031], [0035]-[0036], [0039]-[0041], [0045]-[0047], and Figures 2-4 of the present application.

The method of claim 18 includes forming a rotor core 52 at least partially from a non-corrosive material having one or more slots 54. The rotor core 52 and the slots 54 are integrally formed as a single component. The method also includes forming a sleeve 66 produced at least partially from a non-magnetic, non-sprayed-on, and non-corrosive material directly over and in contact with the rotor core 52. See paragraphs [0029]-[0031], [0035]-[0036], [0039]-[0041], [0045]-[0047], and Figures 3-4 of the present application.

The method of claim 22 includes forming a rotor core 52. A sleeve 66 is formed over and in contact with the rotor core 52 from an at least partially non-sprayed on non-corrosive material. Oxidation of an exterior surface 70 of the sleeve 66 is induced through applied heat. See paragraphs [0029]-[0031], [0035]-[0036], [0039]-[0041], [0045]-[0047], and Figures 2-4 of the present application.

In providing an x-ray tube rotor core and a sleeve formed of a non-corrosive material, the assemblies of claims 1 and 16 minimize particulate formation within the x-ray tube, which can cause damage to the x-ray tube. Also, the stated assemblies in using a non-sprayed-on sleeve prevent particulate formation, which can result from the flaking of a coating. The provision of claim 1, of integrally forming the rotor core and the shaft as a single component, minimizes the number of system components and increases system operating efficiency. In addition, the provision of claim 16 of using bars formed of non-magnetic highly conductive material provides increased current flow for increased rotating efficiency.

The methods of claims 18 and 22 provide similar advantages as that stated for the systems of claims 1 and 16. In addition thereto, the method of claim 22, by inducing oxidation of an exterior surface of a rotor core sleeve, assures that the exterior surface of the sleeve is fully oxidized prior to installation within an x-ray tube. This prevents rusting and corrosion of the sleeve, prevents flaking and/or the formation of particulate, and thus prevents damage to the x-ray tube over time and during operation thereof.

Applicants agree that the prior art within the field of x-ray imaging systems has included the use of x-ray tube rotor cores and shafts. It is also admitted that the prior art includes a method of oxidizing an x-ray tube vacuum housing to obtain desired thermal radiation transfer characteristics thereof. What is not known or suggested are the several novel aspects of the present invention. All of the novel aspects of the present invention are not taught or suggested by the prior art separately or in combination. The novel aspects are described in detail below.

What is not known or suggested is the integral formation of an x-ray tube rotor core and an x-ray tube shaft as a single unit. What is also not known or suggested is the use of an x-ray tube rotor core that is formed of a non-corrosive material. What is further not known or suggested is the formation of a sleeve over an x-ray tube rotor core. Further yet, the formation of a sleeve produced of a non-magnetic, non-sprayed-on, and non-corrosive material over an x-ray tube rotor core is not known or suggested. In addition, the formation of a sleeve directly over and in contact with an x-ray tube rotor core is not known or suggested. Moreover, inducing oxidation of an exterior surface of a sleeve that is formed over an x-ray tube rotor core is also not known or suggested. Additional novel aspects of the claimed invention are recited in the below summary of claims 2-9, 11-12, 14-15, 19, and 23-26 and in the Argument Section below.

Claim 2 recites an imaging X-ray tube rotor assembly 30 according to claim 1 wherein the rotor core 52 is produced from a magnetic non-corrosive material. See paragraph [0030] of the present application.

Claim 3 recites an imaging X-ray tube rotor assembly 30 according to claim 1 wherein the rotor core 52 approximately includes at least 12% chromium. See paragraph [0030] of the present application.

Claim 4 recites an imaging X-ray tube rotor assembly 30 according to claim 1 wherein the rotor core 52 includes stainless steel. See paragraph [0030] of the present application.

Claim 5 recites an imaging X-ray tube rotor assembly 30 according to claim 1 wherein the non-sprayed-on non-corrosive sleeve 66 includes an oxidized exterior surface 70. See paragraphs [0035], and [0046]-[0047] of the present application.

Claim 6 recites an imaging X-ray tube rotor assembly 30 according to claim 1 wherein the slot 54 is integrally formed with the rotor core 52 and the bar 56 is produced from a non-magnetic highly conductive material coupled to the slot 54. See paragraphs [0029] and [0031] of the present application.

Claim 7 recites an imaging X-ray tube rotor assembly 30 according to claim 6 wherein the non-magnetic highly conductive material includes at least one of the following: copper, aluminum, silver, nickel, cobalt, and an alloy formed of two or more of the stated materials. See paragraph [0031] of the present application.

Claim 8 recites an imaging X-ray tube rotor assembly 30 according to claim 1 that further includes slots 54, integrally formed with the rotor core 52, and bars 56, produced from a non-magnetic highly conductive material and coupled to the slots 54. See paragraphs [0029] and [0031] of the present application.

Claim 9 recites an imaging X-ray tube rotor assembly 30 according to claim 8 wherein the non-magnetic highly conductive material includes at least one of the following: copper, aluminum, silver, nickel, cobalt, and an alloy formed of two or more of the stated materials. See paragraph [0031] of the present application.

Claim 11 recites an imaging X-ray tube rotor assembly 30 according to claim 1 wherein an exterior surface 70 of the non-sprayed-on non-corrosive sleeve 66 is oxidized. See paragraphs [0035], and [0046]-[0047] of the present application.

Claim 12 recites an imaging X-ray tube rotor assembly 30 according to claim 1 wherein an exterior surface 70 of the non-sprayed-on non-corrosive sleeve 66 is non-oxidized.

Claim 14 recites an imaging X-ray tube rotor assembly 30 according to claim 1 wherein the non-sprayed-on non-corrosive sleeve 66 includes approximately at least 12% chromium. See paragraphs [0035] of the present application.

Claim 15 recites an imaging X-ray tube rotor assembly 30 according to claim 1 wherein the non-sprayed-on non-corrosive sleeve 66 includes stainless steel. See paragraphs [0035] of the present application.

Claim 19 recites a method according to claim 18 wherein forming a rotor core 52 includes forming the rotor core from chromium. See paragraph [0030] of the present application.

Claim 23 recites a method according to claim 18 that further includes integrally forming a slot 54 in the rotor core 52 and forming a bar 56 within the slot 54 and from a non-magnetic highly conductive material. See paragraphs [0029] and [0031] of the present application.

Claim 24 recites a method according to claim 18 that further includes integrally forming slots 54 in the rotor core 52 and forming bars 56 within the slots 54 and from a non-magnetic highly conductive material. See paragraphs [0029] and [0031] of the present application.

Claim 25 recites a method according to claim 18 that further includes oxidizing an exterior surface 50 of the imaging tube rotor assembly 30. See paragraphs [0028] and [0040] of the present application.

Claim 26 recites an imaging X-ray tube rotor assembly 30 according to claim 1 wherein the non-sprayed-on non-corrosive sleeve 66 includes an oxidized exterior surface 70 that is generated by a greening effect. See paragraphs [0040] and [0046]-[0047] of the present application.

VI. Grounds of Rejection to be Reviewed on Appeal

The following issues are presented in this appeal, which correspond directly to the Examiner's final grounds for rejection in the Final Office Action of October 18, 2005, hereinafter referred to as the "Final Office Action", and in the Advisory Action of December 28, 2005, hereinafter referred to as the "Advisory Action":

(1) whether claims 1-9, 11-12, 14-16, 18-19, and 23-26 are patentable under 35 U.S.C. 103(a) over Klosterman (U.S. Pat. No. 5,056,126) in view of Takahata (U.S. Pat. No. 6,838,798);

(2) whether claims 22 is patentable under 35 U.S.C. 103(a) over Takahata in view of Warren (U.S. Pat. No. 6,390,875 B1); and

(3) whether claims 11 and 26 are patentable under 35 U.S.C. 103(a) over Klosterman in view of Takahata and further in view of Warren. Note with respect to claims 11 and 26 the Advisory Action states that the additional limitations are not entered, but are additionally rejected over Warren. Thus, they are argued both below as though they were entered and as though they were not entered.

VII. Argument

A. THE REJECTION OF CLAIMS 1-9, 11-12, 14-16, 18-19, and 23-26 UNDER 35 U.S.C. § 103(a)

Claims 1-9, 11-12, 14-16, 18-19, and 23-26 stand fully rejected under 35 U.S.C. §103(a) over Klosterman in view of Takahata.

Klosterman discloses an x-ray tube 21 having a squirrel cage rotor 72, which resides within a rotor housing 96, and is formed in a conventional manner from magnetic steel and copper. The rotor housing 96 is a vacuum tight enclosure, which is in communication with the vacuum envelope 41 of the x-ray tube. The rotor housing 96 consists of a sleeve 97 that is stationary and has a thin wall portion 97a. In other words, the rotor sleeve 97 is in the

form of a housing, which encases the rotor 72. The rotor 72 is supported by a sleeve 71 that freely rotates on a bearing assembly 81 within the sleeve 97.

With respect to claims 1, 16, and 18, the Final Office Action states that the elements 71 and 72 of Klosterman form the complete rotor core. The Final Office Action also states that item 71 is needed for the magnetically active portion 72 to function as a rotor. Applicants submit that the sole purpose of the sleeve 71 is to support the rotor 72 and to couple the rotor 72 to the ceramic coupling 66 for rotation thereof. The sleeve 71 is not part of nor should it be considered part of the rotor 72. The sleeve 71 does not provide any magnetic properties or other features that work in conjunction with or enhance the features of the rotor 72. The rotor 72 has the elements needed to function as a rotor. The sleeve 71 is just another element within the x-ray tube 21 that is used to rotate the rotor 72. Just as the ceramic coupling 66 is not part of the rotor 72 and would not be considered as part of a rotor core, the sleeve 71 is also not part of the rotor 72 and would not be considered as part of a rotor core. A "core" refers to the central part of an object. See *Merriam-Webster's Third New International Dictionary*. Although the sleeve 71 is within the rotor 72, since it is not part of the rotor 72 and thus cannot be considered as part of a rotor core.

Applicants submit that although Takahata discloses a rotor core 17, the rotor core 17 is not an x-ray tube rotor core, but rather is an air-conditioning compressor rotor core. Also, nowhere in the Takahata reference is it disclosed or suggested that the rotor core 17 be formed of a non-corrosive material. Thus, neither Klosterman nor Takahata alone or in combination teach or suggest the use of an x-ray tube rotor core that is produced of a non-corrosive material. Also, Takahata is nonanalogous art; see arguments provided below in Section C of this Appeal Brief. As such, Takahata is not a valid reference for which one can rely upon in this case.

With respect to claim 1, Applicants further submit that the neither Klosterman nor Takahata alone or in combination disclose or suggest the use of an x-ray tube rotor core that is integrally formed with an x-ray tube shaft as a single component. The Advisory Action states that the Examiner, in defining the term "integrally formed", must rely upon the plain meaning of the term as provided in a dictionary, which is as cited in the final

rejection. Regardless, of the meaning of the term "integrally formed" it is clear in view of both Klosterman and Takahata that neither reference discloses an x-ray tube rotor core and an x-ray tube shaft that are formed as a single unit as claimed. The shaft 62 of Klosterman is not directly coupled to the rotor 72. Takahata does not disclose a shaft or an x-ray tube shaft. Takahata merely states that a shaft may be inserted into a hole 15 of the rotor core 17.

Throughout the prosecution history, in the specification, and as suggested or recited in the claims the Applicants have defined the term "integrally formed" to refer to the unitary formation of multiple elements as a single part. Neither Klosterman nor Takahata disclose or suggest such formation. In addition, Applicants submit that when extrinsic reference sources evidence more than one definition for a term, the intrinsic record must be consulted to identify which of the different possible definitions is most consistent with applicant's use of the terms. See *Brookhill-Wilk l*, 334 F.3d at 1300, 67 USPQ2d at 1137 (Fed. Cir. 2003). Intrinsic evidence includes the claims, the specification, and the prosecution history. Extrinsic evidence includes dictionaries. Extrinsic evidence is turned to only when the intrinsic evidence is insufficient to establish the clear meaning of the asserted claim. *Zodiac Pool Care Inc. v. Hoffinger Indus. Inc.*, 206 F. 3d 1408, 1414, 54 USPq2d 1141, 1145 (Fed. Cir. 2000) and *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582-84, 39 USPQ2d 1573, 1576-78 (Fed. Cir. 1996). Thus, the intrinsic record includes, not just the application, but also the intended interpretations and other related descriptions provided by the Applicants in the prosecution history.

The prosecution history is often most probative of claim term meaning. Appellants submit that the Board should consider the application's prosecution history in determining the meaning and scope of claim terms. The history contains the complete record of all of the proceedings before the Patent and Trademark Office, including any express representations made by the Appellants regarding the scope of the claims. As such, the record before the Patent and Trademark Office is often of critical significance in determining the clearest meaning of the claims. See *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 980, 34 USPQ2d 1321, 1330 (Fed. Cir. 1995).

The Applicants submit that in interpreting the term "integrally formed", especially in combination with the claimed terms "as a single component", the Applicants clearly did not intend such terms to refer to that disclosed in Klosterman and Takahata. Specifically, the stated terms were not intended to mean an x-ray tube rotor core and an x-ray tube shaft that are two separate and distinct entities and that are not directly coupled to each other, as with respect to Klosterman. The stated terms were also not intended to mean a non-x-ray rotor core and a non-x-ray shaft that are two separate and distinct entities, as with respect to Takahata. Applicants have expressly submitted herein and throughout the prosecution history that the stated terms refer to the formation of a single component or unit. Thus, to suggest a broad reasonable interpretation of the term "integrally formed" to be a unit having multiple parts would be inconsistent with the prosecution history and the present application as a whole. Such an interpretation is simply unreasonable and improper.

In addition, claims terms ought to be construed in view of the intrinsic evidence, which is the primary source of claim interpretation. See *Phillips v. AWH Corp.* No. 03-1269, 75 USPQ2d 1321 (Fed. Cir. 2005). The intrinsic record clearly provides for the intended meaning of the claim terms. Therefore, one cannot deem the definitions of the terms "integrally formed" other than as Applicants have unequivocally pronounced.

With respect to claims 1, 16, 18, and 22, Applicants submit that the neither Klosterman nor Takahata alone or in combination disclose or suggest a sleeve over an x-ray tube rotor core, especially as claimed. The Office Actions admittedly state that Klosterman fails to disclose a sleeve formed of a non-magnetic, non-sprayed on, non-corrosive material that is over and in contact with, and rotational with a rotor core. Applicants submit that Klosterman also fails to teach or suggest a sleeve that is over and rotational with a rotor core or a sleeve that is over and in contact with a rotor core. The sleeve 71 of Klosterman, as stated above, is within and not over the rotor 72. Also, the sleeve 97 houses the rotor 72. The sleeve 97 is not in contact with the rotor 72 and is stationary.

The Office Actions relies on Takahata for the disclosure of a sleeve that is formed of stainless steel over a rotor core. Although Takahata discloses a sleeve that is formed of

stainless steel over a rotor core, the rotor core is not part of an x-ray system, but rather is part of an air-conditioning system. Takahata, as stated, is nonanalogous art and thus should not be relied upon.

Also, referring to MPEP 706.02(j) and 2143, to establish a *prima facie* case of obviousness the prior art reference(s) must teach or suggest all the claim limitations. *In Re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). Thus, Applicants submit that Klosterman and Takahata, alone or in combination, fail to teach or suggest each and every limitation of claims 1, 16, and 18, therefore the combinations in claim 1 , 16, and 18 are not found in the prior art and each of the stated claims are believed to be independently patentable and allowable for the above-stated reasons.

Claim 2 is believed to be independently patentable and allowable for the reasons set forth above since it depends from claim 1. Claim 2 is further believed to be independently patentable and allowable since it further recites that wherein the rotor core is produced from a magnetic non-corrosive material.

Claim 3 is believed to be independently patentable and allowable for the reasons set forth above since it depends from claim 1. Claim 3 is further believed to be independently patentable and allowable since it further recites that wherein the rotor core approximately includes at least 12% chromium.

Claim 4 is believed to be independently patentable and allowable for the reasons set forth above since it depends from claim 1. Claim 4 is further believed to be independently patentable and allowable since it further recites that wherein the rotor core includes stainless steel.

Claim 5 is believed to be independently patentable and allowable for the reasons set forth above since it depends from claim 1. Claim 5 is further believed to be independently patentable and allowable since it further recites that wherein the non-sprayed-on non-corrosive sleeve includes an oxidized exterior surface.

Claim 6 is believed to be independently patentable and allowable for the reasons set forth above since it depends from claim 1. Claim 6 is further believed to be independently patentable and allowable since it further recites that wherein the slot is integrally formed

with the rotor core and the bar is produced from a non-magnetic highly conductive material coupled to the slot.

Claim 7 is believed to be independently patentable and allowable for the reasons set forth above since it depends from claim 6. Claim 7 is further believed to be independently patentable and allowable since it further recites that wherein the non-magnetic highly conductive material includes at least one of the following: copper, aluminum, silver, nickel, cobalt, and an alloy formed of two or more of the stated materials.

Claim 8 is believed to be independently patentable and allowable for the reasons set forth above since it depends from claim 1. Claim 8 is further believed to be independently patentable and allowable since it further recites slots, integrally formed with the rotor core, and bars, produced from a non-magnetic highly conductive material and coupled to the slots.

Claim 9 is believed to be independently patentable and allowable for the reasons set forth above since it depends from claim 8. Claim 9 is further believed to be independently patentable and allowable since it further recites that wherein the non-magnetic highly conductive material includes at least one of the following: copper, aluminum, silver, nickel, cobalt, and an alloy formed of two or more of the stated materials.

Claim 11 is believed to be independently patentable and allowable for the reasons set forth above since it depends from claim 1. Claim 11 is further believed to be independently patentable and allowable since it further recites that wherein an exterior surface of the non-sprayed-on non-corrosive sleeve is oxidized.

Claim 12 is believed to be independently patentable and allowable for the reasons set forth above since it depends from claim 1. Claim 12 is further believed to be independently patentable and allowable since it further recites that wherein an exterior surface of the non-sprayed-on non-corrosive sleeve is non-oxidized.

Claim 14 is believed to be independently patentable and allowable for the reasons set forth above since it depends from claim 1. Claim 14 is further believed to be independently patentable and allowable since it further recites that wherein the non-sprayed-on non-corrosive sleeve includes approximately at least 12% chromium.

Claim 15 is believed to be independently patentable and allowable for the reasons set forth above since it depends from claim 1. Claim 15 is further believed to be independently patentable and allowable since it further recites that wherein the non-sprayed-on non-corrosive sleeve includes stainless steel.

Claim 19 is believed to be independently patentable and allowable for the reasons set forth above since it depends from claim 18. Claim 19 is further believed to be independently patentable and allowable since it further recites that wherein forming a rotor core includes forming the rotor core from chromium.

Claim 23 is believed to be independently patentable and allowable for the reasons set forth above since it depends from claim 18. Claim 23 is further believed to be independently patentable and allowable since it further recites integrally forming a slot in the rotor core and forming a bar within the slot and from a non-magnetic highly conductive material.

Claim 24 is believed to be independently patentable and allowable for the reasons set forth above since it depends from claim 18. Claim 24 is further believed to be independently patentable and allowable since it further recites integrally forming slots in the rotor core and forming bars within the slots and from a non-magnetic highly conductive material.

Claim 25 is believed to be independently patentable and allowable for the reasons set forth above since it depends from claim 18. Claim 25 is further believed to be independently patentable and allowable since it further recites oxidizing an exterior surface of the imaging tube rotor assembly.

Claim 26 is believed to be independently patentable and allowable for the reasons set forth above since it depends from claim 1. Claim 26 is further believed to be independently patentable and allowable since it further recites that the non-sprayed-on non-corrosive sleeve includes an oxidized exterior surface that is generated by a greening effect.

B. THE REJECTION OF CLAIM 22 UNDER 35 U.S.C. § 103(a)

Claim 22 stands fully rejected under 35 U.S.C. § 103(a) over Takahata in view of Warren. Claim 22 recites the limitation of forming a sleeve 66 over and in contact with a rotor core 52. Applicants are unable to find such disclosure in Warren. Warren does not disclose a sleeve or the formation of a sleeve over a rotor. Thus, since Takahata is nonanalogous art, Applicants believe that claim 22 is independently patentable and allowable for the above-stated reasons.

The Final Office Action states that Takahata fails to disclose the practice of inducing oxidation of an exterior surface of a sleeve by applying heat. Applicant agrees. The Office Action states, however, that Warren provides such teaching. Applicants agree that Warren discloses selectively oxidizing an x-ray tube component. Specifically, Warren discloses the oxidizing of a vacuum housing to provide desired thermal radiation transfer characteristics. Applicants submit that Warren does not explicitly mention the oxidation of a sleeve. There is no suggestion anywhere in Warren that oxidation of a sleeve is desired.

Referring to MPEP 2143.01, the fact that the claimed invention is within the capabilities of one of ordinary skill in the art is not sufficient by itself to establish a *prima facie* obviousness. An objective reason must be suggested within the references to make such modifications necessary to arrive at the present invention. Referring to MPEP 2143.01, the mere fact that a reference can be modified does not render the resultant obvious unless the prior art suggests the desirability thereof. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). There is no suggestion in either reference for the oxidation of a sleeve. There has also been no suggestion or motivation provided for the combination and modification of the stated references as is necessary to arrive at the claimed invention. A primary purpose in performing the stated oxidation process, as disclosed in the present application, is to solve the problem of flaking due to portions of a coating separating from a component on which it is applied. The claimed invention, in other words, prevents the formation of particulate. Neither Takahata nor Warren mention or solve this problem. Besides, Takahata is nonanalogous art.

Therefore, Applicants believe that claim 22 is further independently patentable and allowable for the stated reasons.

C. THE ANALOGOUSNESS OF THE TAKAHATA REFERENCE

With respect to claims 1-9, 11-12, 14-16, 18-19, and 22-26, Applicants submit that Takahata is nonanalogous art and thus is not a valid reference. Referring to MPEP 2141.01(a), while the Patent Office classification of references and cross-references in the official search notes are some evidence of "nonanalogy" or "analogy" respectively, the court has found "the similarities and differences in structure and function of the inventions to carry far greater weight." *In re Ellis*, 476 F.2d 1370, 1372, 177USPQ526, 527 (CCPA 1973). In addition, to the classifications of the references inferring nonanalogy, Applicant submits that the structure, functions, and purposes of the electric machine of Takahata are clearly different than that of the present invention. Takahata would not have logically commended itself to the inventors' attention in considering the problems solved by the claimed assemblies and methods of the present application.

In developing a rotor for an x-ray tube of a computed tomography imaging system or the like, one would clearly not look to an electric machine designed for a compressor of a residential or commercial air-conditioning system. It is irrelevant that the electric machine of Takahata has a stator and a rotor. Many electric motors have a stator and a rotor. One cannot assume that all electric motors that have stators and rotors are related and analogous nor can one be expected to search all electric motors in all arts in solving the problems associated with a particular system in a particular art. Such a task would be unreasonably burdensome.

Electric motors can be substantially different from application to application. The electric motor for an air-conditioning compressor is different than and is not interchangeable with an electric motor of an x-ray tube. For example, in one embodiment of the present invention a squirrel cage rotor design is provided, which is clearly unlike the permanent magnet design of the rotor of Takahata. The squirrel cage includes multiple slots and bars. The bars are integrally formed with end caps as a single component. The

permanent magnet design of Takahata simply includes a few magnets that are held on a rotor core. Thus, the rotor designs or assemblies are different.

In addition, the rotor claimed includes a sleeve that is used to prevent the reduction in the amount of flux and the transfer of electromagnetic current. On the other hand, the protective cover 19 of Takahata is incorporated and used to cancel out the magnetic flux from higher harmonic current components. There is also no implication that the use of an element in the air-conditioning setting is appropriate for use in the x-ray imaging environment. The operating environments in an air-conditioner are substantially different than that within an x-ray tube. Thus, one would clearly not look to an electric motor for an air-conditioning compressor in designing an electric motor for an x-ray tube.

Takahata would not be reasonably pertinent to the particular problems solved by the claimed inventions. Thus, the Applicants submit that Takahata is nonanalogous art and to use such a reference is far reaching at best.

With regard to the motivation to combine Takahata and Klosterman, the Advisory Action and Final Office Action state that since A) stainless steel is used in vacuum environments, such as for vacuum housings, vacuum envelopes, and rotating anode linkages as evidenced by Warren and Klosterman; B) Takahata discloses the use of a sleeve formed of stainless steel; and C) the sleeve of Takahata rotates at high speeds, that such a combination and modification would be desired. Applicants submit that the use of stainless steel for a particular component on a first system, such as that of Takahata, does not in anyway suggest the use of such material or of such a component on another system, such as that of Klosterman. This is especially true since the art in which the references reside and the systems associated therewith are unrelated.

The Advisory Action states that when one designs an x-ray tube there are considerations of cooling, which would make one skilled in the art review cooling systems, into which the motor of Takahata applies. Applicants agree that in designing an x-ray tube that there are cooling considerations, however, the design of an x-ray tube is different than the design of a cooling system for an x-ray tube. Clearly the design of an x-ray tube rotor is different than the design of a component within a cooling circuit of that x-ray tube. Note

that an x-ray tube rotor is not part of a cooling system, as is a compressor. Also, a cooling system for an x-ray tube, such as one having a cooling circuit with a chiller and other related devices, is not the same as a cooling system for residential or commercial applications. An x-ray tube cooling circuit typically uses a chiller and a heat exchanger, whereas as a residential or commercial cooling circuit has an air-conditioner with a compressor and a condenser. When one is attempting to increase rotating efficiency and emissitivity of a rotor within an x-ray tube one is not looking to cooling systems for answers. Also, corrosion of an x-ray tube rotor is unrelated to corrosion in a cooling system that has cooling fluids. The corrosion in an x-ray tube forms particulate which can substantially affect operation of and/or cause damage to the x-ray tube. Corrosion within an air-conditioning condenser, in general, has minimal affect on the operation of that condenser and the operation of the associated air-conditioning system.

The Advisory Action also states that the Examiner cannot look at every possible prior art resource for every possible prior art reference. Time is of the essence, as it is for one skilled in the art when designing a new product. The Advisory Action also states that search terms from the present application were used to obtain the prior art of record in a reasonable amount of time. Applicants submit that selective picking and choosing of certain terms within an application can cause the finding of nonanalogous art. The use of a term within a reference that is used in the present application does not suggest in anyway that the reference is analogous. The reference must have similarities in structure and function. Applicants have shown above that such similarities have not been shown. Also, as suggested by the Examiner it would be unreasonably burdensome to expect that an inventor search all electric motors in all applications when developing an x-ray tube rotor assembly. The Examiner cannot expect that an inventor would have looked to a rotor for a compressor of a residential or commercial air-conditioning system in developing an x-ray tube rotor for an x-ray system.

D. THE REJECTION OF CLAIMS 11 and 26 UNDER 35 U.S.C. § 103(a)

Claims 11 and 26 stand fully rejected under 35 U.S.C. §103(a) over Klosterman in view of Takahata and further in view of Warren. Applicants submit that since claims 11 and 26 depend from claim 1, that they are also believed to be independently patentable and allowable for the same reasons. Also, for similar reasons as stated above in Section B of this Appeal Brief with respect to claim 22 Klosterman and Takahata alone or in combination fail to teach or suggest the oxidization claimed. Thus, claims 11 and 26 are believed to be further novel and nonobvious for the stated reasons regardless of whether the amendments of December 16th are entered.

VIII. Appendix

A copy of the claims involved in this appeal, namely claims 1-9, 11-12, 14-16, 18-19, and 22-26 is attached hereto as Appendix A. An evidence Appendix B and a related proceedings Appendix C are also provided.

IX. Conclusion

For the reasons advanced above, Appellants respectfully contend that each claim is patentable. Therefore reversal of the rejection is requested.

Respectfully submitted,

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Dated: March 2, 2006

APPENDIX A

What is claimed is:

1. An imaging X-ray tube rotor assembly for an imaging tube comprising:

a shaft;

an x-ray tube rotor core produced at least partially of a non-corrosive material and integrally formed as a single component with said shaft comprising;

at least one slot; and

at least one bar; and

a non-sprayed-on non-corrosive sleeve directly coupled to, at least partially covering, and rotational with said rotor core.

2. An imaging X-ray tube rotor assembly as in claim 1 wherein said rotor core is produced at least partially from a magnetic non-corrosive material.

3. An imaging X-ray tube rotor assembly as in claim 1 wherein said rotor core approximately comprises at least 12% chromium.

4. An imaging X-ray tube rotor assembly as in claim 1 wherein said rotor core at least partially comprises stainless steel.

5. An imaging X-ray tube rotor assembly as in claim 1 wherein said non-sprayed-on non-corrosive sleeve comprises an oxidized exterior surface.

6. An imaging X-ray tube rotor assembly as in claim 1 wherein said slot is integrally formed with said rotor core and said bar is produced at least partially from a non-magnetic highly conductive material coupled to said slot.

7. An imaging X-ray tube rotor assembly as in claim 6 wherein said non-magnetic highly conductive material comprises at least one of the following: copper, aluminum, silver, nickel, cobalt, and an alloy formed of two or more of the stated materials.

8. An imaging X-ray tube rotor assembly as in claim 1 further comprising:

a plurality of slots integrally formed with said rotor core; and

a plurality of bars produced at least partially from a non-magnetic highly conductive material and coupled to said plurality of slots.

9. An imaging X-ray tube rotor assembly as in claim 8 wherein said non-magnetic highly conductive material comprises at least one of the following: copper, aluminum, silver, nickel, cobalt, and an alloy formed of two or more of the stated materials.

10. An imaging X-ray tube rotor assembly for an imaging tube comprising:

a rotor core comprising;

at least one slot; and

at least one bar;

a non-sprayed-on non-corrosive sleeve coupled to and at least partially covering said rotor core; and

a sheet coupled to said rotor core and produced at least partially from a non-magnetic highly conductive material.

11. An imaging X-ray tube rotor assembly as in claim 1 wherein an exterior surface of said non-sprayed-on non-corrosive sleeve is oxidized.

12. An imaging X-ray tube rotor assembly as in claim 1 wherein an exterior surface of said non-sprayed-on non-corrosive sleeve is non-oxidized.

13. An imaging X-ray tube rotor assembly as in claim 10 wherein said non-magnetic highly conductive material comprises at least one of the following: copper, aluminum, silver, nickel, cobalt, and an alloy formed of two or more of the stated materials.

14. An imaging X-ray tube rotor assembly as in claim 1 wherein said non-sprayed-on non-corrosive sleeve comprises approximately at least 12% chromium.

15. An imaging X-ray tube rotor assembly as in claim 1 wherein said non-sprayed-on non-corrosive sleeve comprises stainless steel.

16. An imaging X-ray tube rotor assembly comprising:

an x-ray tube rotor core produced at least partially from stainless steel and comprising;

a plurality of slots integrally formed with said rotor core; and

a plurality of bars produced at least partially from a non-magnetic highly conductive material and coupled to said plurality of slots; and

a non-sprayed-on sleeve in contact with, coupled over, and rotational with said rotor core.

18. (Previously Presented) A method of producing an imaging X-ray tube rotor assembly comprising:

forming a rotor core at least partially from a non-corrosive material having at least one slot, wherein said rotor core and said at least one slot are integrally formed as a single component; and

forming a sleeve produced at least partially from a non-magnetic, non-sprayed-on, and non-corrosive material directly over and in contact with said rotor core.

19. A method as in claim 18 wherein forming a rotor core comprises forming said rotor core at least partially from chromium.

20. A method of producing an imaging X-ray tube rotor assembly comprising:

forming a rotor core at least partially from a magnetic non-corrosive iron based material;

forming a sleeve produced at least partially from a non-magnetic, non-sprayed-on, and non-corrosive material directly over and in contact with said rotor core; and

forming a sheet over said rotor core and at least partially from a non-magnetic highly conductive material.

22. A method of producing an imaging X-ray tube rotor assembly comprising:

forming a rotor core;

forming a sleeve over and in contact with said rotor core from at least partially a non-sprayed on non-corrosive material; and

inducing oxidation of an exterior surface of said sleeve through applied heat.

23. A method as in claim 18 further comprising:

integrally forming a slot in said rotor core; and

forming a bar within said slot and at least partially from a non-magnetic highly conductive material.

24. A method as in claim 18 further comprising:

integrally forming a plurality of slots in said rotor core; and

forming bars within said plurality of slots and at least partially from a non-magnetic highly conductive material.

25. A method as in claim 18 further comprising oxidizing an exterior surface of the imaging tube rotor assembly.

26. An imaging X-ray tube rotor assembly as in claim 1 wherein said non-sprayed-on non-corrosive sleeve comprises an oxidized exterior surface generated by a greening effect.

APPENDIX B

No submitted or entered evidence.

APPENDIX C

No related proceedings.

ITW / AFF

PTO/SB/17 (12-04)
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Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL
For FY 2005

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT	($) 500.00

Complete if Known	
Application Number	10/604,498
Filing Date	July 25, 2003
First Named Inventor	Steinlage, et al.
Examiner Name	Thomas R. Artman
Art Unit	2882
Attorney Docket No.	15XT6176 (GEMS-A 0130 PA)

METHOD OF PAYMENT (check all that apply)

☐ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____

☑ Deposit Account Deposit Account Number: 070845 Deposit Account Name: GTC

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☑ Charge fee(s) indicated below ☐ Charge fee(s) indicated below, **except for the filing fee**

☑ Charge any additional fee(s) or underpayments of fee(s) under 37 CFR 1.16 and 1.17 ☑ Credit any overpayments

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

Application Type	FILING FEES Fee ($)	FILING FEES Small Entity Fee ($)	SEARCH FEES Fee ($)	SEARCH FEES Small Entity Fee ($)	EXAMINATION FEES Fee ($)	EXAMINATION FEES Small Entity Fee ($)	Fees Paid ($)
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Fee ($)	Small Entity Fee ($)
Each claim over 20 or, for Reissues, each claim over 20 and more than in the original patent	50	25
Each independent claim over 3 or, for Reissues, each independent claim more than in the original patent	200	100
Multiple dependent claims	360	180

Total Claims	Extra Claims	Fee ($)	Fee Paid ($)
_____ - 20 or HP =	_____	x _____	= _____

HP = highest number of total claims paid for, if greater than 20

Indep. Claims	Extra Claims	Fee ($)	Fee Paid ($)
_____ - 3 or HP =	_____	x _____	= _____

HP = highest number of independent claims paid for, if greater than 3

Multiple Dependent Claims Fee ($)	Fee Paid ($)
_____	_____

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee ($)	Fee Paid ($)
_____ - 100 =	_____	/ 50 = _____ (round **up** to a whole number)	x _____	= _____

4. OTHER FEE(S)

	Fees Paid ($)
Non-English Specification, $130 fee (no small entity discount)	
Other: Appeal Brief	500.00

SUBMITTED BY

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Name (Print/Type)	Jeffrey J. Chapp		Date March 2, 2006